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for the Behavioral and Social Sciences**

Research Report 1523

Integrating National Training Center Feedback Into Home Station Training Management

James L. Fobes and Larry L. Meliza
U.S. Army Research Institute

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Research Report 1523

Integrating National Training Center Feedback Into Home Station Training Management

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FOREWORD

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has a major research program in support of the National Training Center (NTC) sponsored by the Training and Doctrine Command and the Deputy Chief of Staff for Personnel. One of the principal goals of this program is the development of Lessons Learned methods for training, doctrine, organization, personnel, and equipment.

The research described in this report was conducted by ARI's Presidio of Monterey Field Unit, whose mission is to increase Army unit combat performance capabilities by improving unit performance measurement and evaluation methods, unit training programs and management tools, and the NTC and home station data base.

The program task supporting this mission is entitled "Unit Performance Measurement and Field Feedback from the Combat Training Centers," organized under the "Maintain Force Readiness" program area. Combined Arms Training Activity (CATA) sponsorship is contained in the Memorandum of Agreement "Combat Training Center (CTC) and Unit Home Station Training and Lessons Learned System" (2 May 1988).

This research is part of a collaborative effort between CATA NTC Observations Division and ARI (POM) to develop improved After Action Reviews (AAR) and Take Home Packages (THP). Specific requirements were identified that should improve the use of NTC take home packages for corrective and sustainment training at home station. The CATA NTC Observations Division was briefed (September 1987) on the information in this document and has incorporated the findings into their work on THP modifications.



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INTEGRATING NATIONAL TRAINING CENTER FEEDBACK INTO HOME STATION TRAINING MANAGEMENT

EXECUTIVE SUMMARY

Requirement:

This research assesses home station usage of National Training Center (NTC) Take Home Packages (THPs) and identifies changes to enhance their home station corrective and sustainment training.

Procedures:

Rotating-unit commanders from three divisions were interviewed in March and April of 1987 to determine THP contributions to their post-NTC corrective and sustainment training and NTC train up as well as potential changes to improve THPs. Interviews were conducted before THP coordination responsibility was transferred to the NTC Observation Division (June 1987).

Revisions suggested by commanders are presented here within the context of Army initiatives relevant to restructuring THPs.

Findings:

Commanders reported the written portion of the THP does not effectively support post-rotational corrective and sustainment training at home station. Users indicated the material is too extensive and complex, contains many inconsistencies, and lacks specific recommendations for corrective training.

The NTC Observation Division has subsequently revised the THP. Accordingly, commanders' reactions to the current THPs may differ from those depicted here.

Commanders' recommendations for improving the written section emphasized providing information on

- mission outcome,
- major strengths and weaknesses,
- critical underlying events, and
- specific training recommendations for particular units.

A strawman revision reflects user interviews and capitalizes on potential benefits of ongoing initiatives to improve NTC and home station training.

Utilization of Findings:

The NTC Operations Group, CATA, and ARI are using these findings to recommend changes in the written THP.

INTEGRATING NATIONAL TRAINING CENTER FEEDBACK INTO HOME STATION TRAINING MANAGEMENT

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INTEGRATING NATIONAL TRAINING CENTER FEEDBACK INTO HOME STATION TRAINING MANAGEMENT

Effective training management is necessary for maximizing Army efforts to achieve and maintain combat readiness. The foundation of such management is a realistic assessment of unit capability. This report integrates several factors relevant to improving the integration of Combat Training Centers' (CTC) performance assessment and feedback into home station training management.

Unit training for many divisions includes rotations to the Army's National Training Center (NTC). The NTC provides training on both force-on-force engagement simulation and live fire exercises against realistically simulated Warsaw Pact forces. These experiences provide a unique opportunity to measure and assess strengths and weaknesses in unit performance. Elaborate feedback on unit performance at the NTC is provided in a Take Home Package (THP). Because THP preparation requires a substantial amount of time and effort by the NTC Operations Group, enhancing THP utility for home station training guidance is a high-priority item for the Combined Arms Training Activity (CATA).

This report begins with a brief description of home station training management doctrine (FM 25-100). It then describes revisions in NTC training management to make NTC training more

compatible with home station training management. Home station training management needs for performance assessment information from the NTC, determined through an ARI survey of rotating-unit commanders, are described against this background.

These factors are integrated within potential THP revisions featuring: measurement system and data base components of a new performance assessment system; as well as Sun Workstation and "electronic clipboard" upgrades to NTC instrumentation. THP changes suggested by commanders emphasize providing units with information describing: missions undertaken; an echelon's Mission Essential Task List (METL) and training objectives; mission effectiveness; mission/task analyses of the causes of mission outcomes; and training recommendations for various task force elements. This approach represents a combined effort by ARI, CATA, and the NTC Operations Group and is intended for diverse CTC applications.

SECTION II. COMBAT TRAINING CENTERS

Realistic and effectively managed training is the key to readiness and successful soldier, leader, and team performance. Combined arms training on a large scale frequently requires resources unavailable at home station. The Army is accordingly developing CTCs to provide highly realistic training settings unavailable at home station. Most CTCs provide rotating units with an environment to train on tactical missions with force-on-force engagements against an opposing force. These engagements are simulated with the Multiple Integrated Laser Engagement System (MILES). At some centers, training also includes live fire exercises on instrumented ranges.

The Battle Command Training Program (BCTP) is coordinated from Fort Leavenworth. It provides advanced combat training opportunities to division and corps commanders and their battle staffs, featuring computerized battle simulation. The Joint Readiness Training Center (JRTC) at Fort Chaffee trains nonmechanized infantry battalions. Rotating units include light infantry, airborne, air assault, and ranger units. The Combat Maneuver Training Complex (CMTC) is under development in Europe to train USAREUR forward-deployed battalions.

The NTC is located at Fort Irwin and trains heavy brigade slices in mid- to high-intensity conflict scenarios. Feedback is

provided by permanently stationed observer-controllers (OCs) with the assistance of a sophisticated instrumentation system. The opposing force is similarly permanently stationed, providing a realistic threat for force-on-force training. The NTC additionally includes live fire training exercises.

Training Interface

Training management at the NTC has been modified to compliment the Unit Training Management Cycle used at home station. Missions assigned to divisions are decomposed into their numerous component tasks necessary for mission accomplishment. The division commander accomplishes this by analyzing mission requirements and setting goals which determine the division's METL (FM 25-100). The METL for each echelon consists of critical collective tasks and their component individual soldier and leader tasks. A particular echelon's METL includes only those tasks for which the unit directly controls necessary personnel, equipment, and resources. That is, an echelon's METL does not include a subordinate units' tasks.

Subordinate commanders in turn develop their echelon's mission and corresponding METL, reflecting a unique contribution for accomplishing division missions. By providing a common and stable focus, METL ensures that training, planning, resources, and execution are directed towards the unit's mission.

Mission preparation requires that each echelon conducts extensive training on their METL components. Current doctrine for managing unit training is summarized in FM 25-100 and illustrated in Figure 1. This home station training is complimented by the opportunity provided at the NTC. Rotating units provide their METL and training objectives to the NTC staff as diagramed in Figure 2. Unit METL and training objectives drive NTC training by guiding development of training scenarios and selection of specific tasks to be evaluated. This approach can serve as a prototype for other CTC elements.

Performance Diagnostics

The NTC Operations Group provides units with detailed performance feedback through informal coaching, After Action Reviews (AARs), and THPs. The AAR is conducted at the task force, company, and platoon levels after each mission. AARs are conducted for Combat Service Support (CSS) approximately every four days. Close Air Support and Fire Support AARs are given at least once every rotation. Task force and CSS AARs are video taped and copies are given to units as they leave the NTC.

The NTC THP includes these AAR tapes along with an extensive written description of unit performance on each mission conducted. Feedback is provided within operating systems of intelligence, maneuver, fire support, air defense artillery,

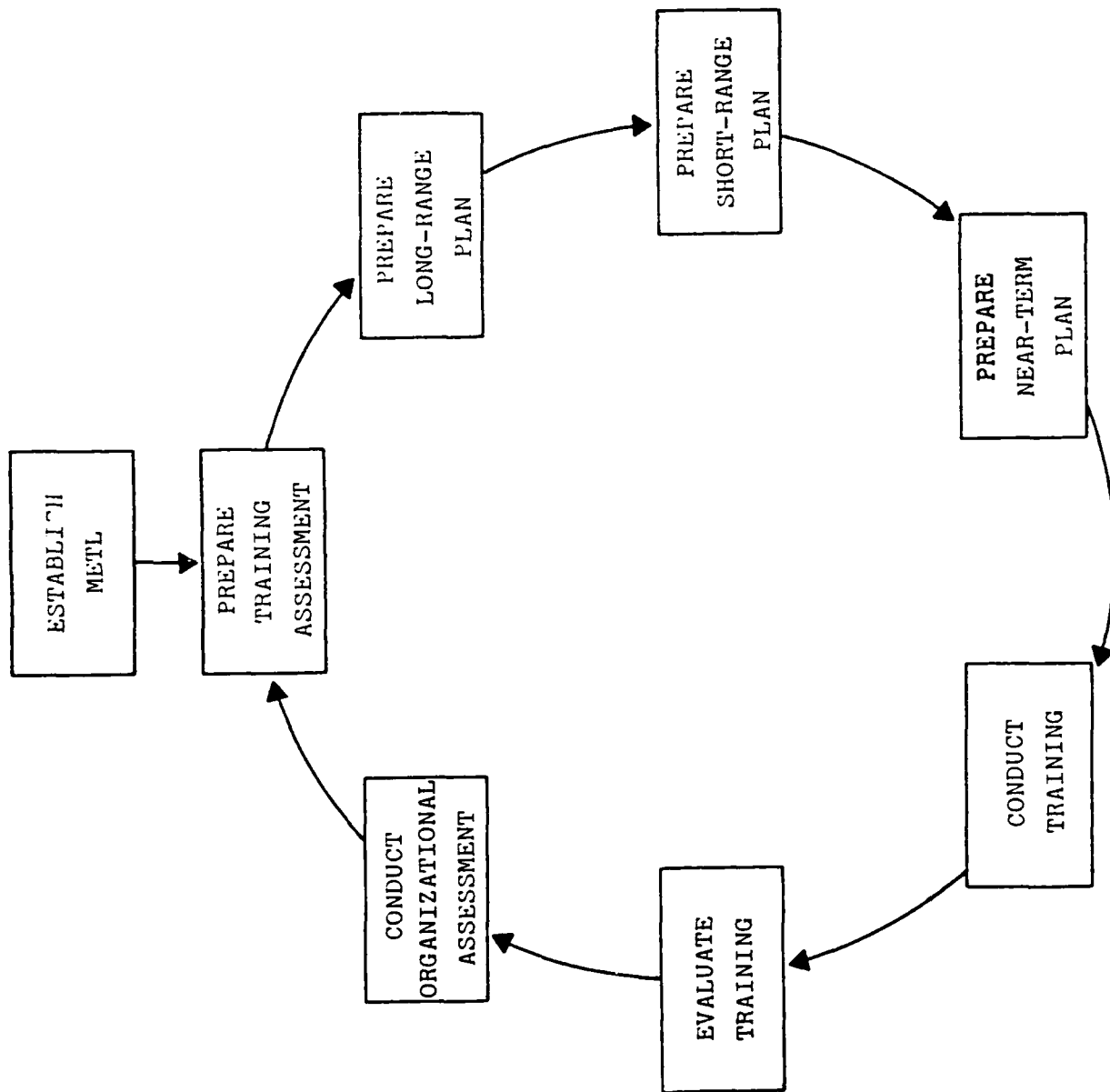


Figure 1. Unit training management cycle

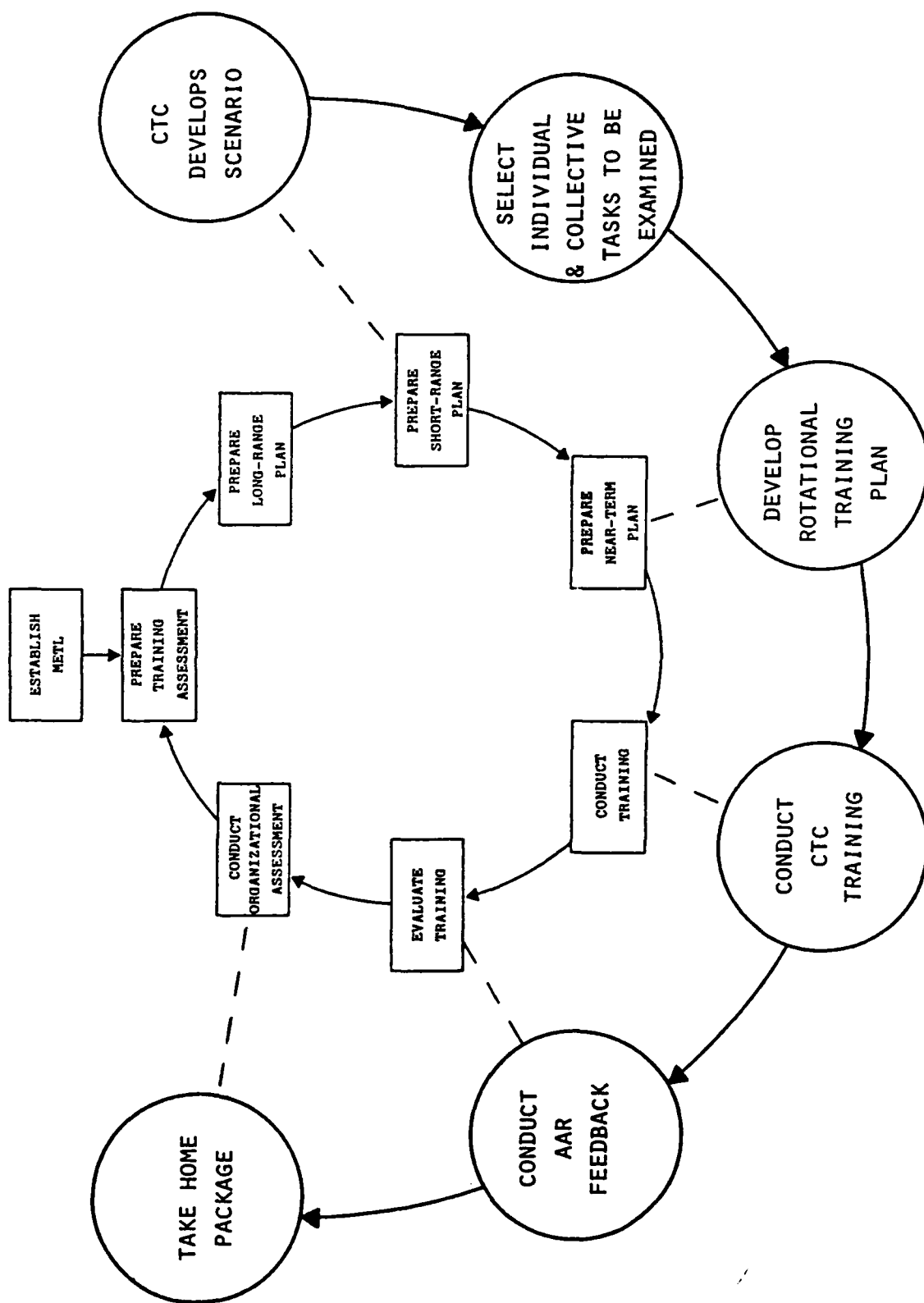


Figure 2. CTC training Interface

mobility/countermobility/survivability, command/control, and combat service support. Performance is separately described for the brigade staff, task force, company/teams, and attached units (forward support, fire support and aviation). The THP is mailed to a unit within 10 days after completion of the rotation.

The recent emphasis on having METL determine CTC training has implications for revising the THP design. Feedback in AARs and THPs will increase in value as the NTC becomes more experienced with examining critical tasks that support units' METL. Additional critical considerations have been identified through an ARI survey of home station users of NTC THPs. As described in the section on proposed changes in THP design, METL may provide the structure for feedback to guide home station corrective and sustainment training.

SECTION III. USER SURVEY

The Army intends to maximize its training value received by ensuring that CTC experiences effectively support training at home station. The THP provides the formal linkage mechanism between CTC experiences and subsequent corrective and sustainment training. Preparation of the NTC's written THP, which may exceed 1,000 pages in length, requires a substantial time investment by members of the NTC Operations Group. Because of the importance of effectively linking NTC and home station training, and due to the substantial cost of THP preparation, CATA requested ARI's assistance in assessing and improving utilization of NTC performance feedback. The user survey conducted by ARI-POM assessed THP utility for home station training and identified changes in THP design and content desired by home station trainers.

ARI interviewed unit commanders with recent NTC experience. These leaders commanded units in three different divisions (armor, mechanized infantry, and armored cavalry) and occupied the duty positions listed on the next page.

Duty Position	

DIV	G-3
BDE	Commander and/or S-3
BN	Armor Commander and/or S-3
	Infantry (Mech) Commander and/or S-3
	Forward Support Commander and/or S-3
	Aviation Commander and/or S-3
	Field Artillery Commander and/or S-3
CO	Armor Commander
	Infantry Commander

Each leader was asked to comment on that portion of the THP relevant to his echelon. That is, the entire package was discussed at division and brigade levels. Individual battalion commanders dealt only with the section on his unit (e.g., the forward support section for the forward support battalion commander). Company commanders discussed their company/team sections. Commanders were questioned about the usefulness of the existing THP format and contents, and were asked to recommend changes to improve its design and contents. Interviews addressed both NTC train up and post-rotation corrective and sustainment training. Train-up issues included unit composition, training activities, and how THPs were used in training. Post-rotation

issues were unit composition and training activities incorporating THP feedback for corrective and sustainment training.

Results

Commanders consider the written THP to be too large and too complex. They also indicated this material contains considerable amounts of unnecessary information and omits critical details on specific training needs. Commanders reported they do not have enough time to extract useful training guidance because of the THP's size and organization. One interviewee demonstrated excessive THP verbiage by pointing out four pages devoted to describing a minor facet (maintenance) of one operating system (CSS) within a single mission. Most importantly, the THP does not describe performance strengths and weaknesses in adequate detail for commanders to identify required corrective and sustainment training.

One interviewee said some THP comments, such as "unit makes poor use of preplanned fires," fail to define both the individual(s) requiring training and the scope of training necessary. (e.g., Did the leader select poor locations for preplanned fires or fail to call for these fires? Did the forward observer fail to adjust fires?) Others similarly indicated that THP comments, such as "unit failed to boresight

weapons daily", define the scope of a training requirement but fail to specify who requires training. Commanders did not know whether boresight failures were a common problem across the task force or restricted to a single platoon. Questions regarding who needs what training are particularly important when the unit contains a number of cross-attached elements.

Inconsistencies within a THP further degrade its value. For example, a respondent noted his THP stated "the unit made good use of preplanned fires". Two paragraphs later, the THP said his unit "made poor use of preplanned fires." Inconsistencies also exist between the written and video portions of a THP. A leader indicated that during the AAR his unit was reported to be doing a good job of boresighting. In contrast, his written feedback said "boresighting was inconsistent."

Interviewees reported extensive usage of the video tape portion of the THP. The only recommendation for improving these tapes was to provide paper copies of the briefing charts displayed. AAR tapes were reported to be used as training aids and topics addressed were considered critical to success at the NTC. This was because deficiencies mentioned were usually tied directly to mission outcome. For example, "the unit maintenance collection point was overrun and eight vehicles were lost because mechanics broke light discipline." AAR tapes also frequently provided solutions to problems in training with the unit's SOP.

Continuing with the example, the AAR tape might indicate what mechanics can do to continue their work at night without breaking light discipline.

How Leaders Used the Information

Leaders want information from the NTC to improve unit SOPs, refine their Table of Organization and Equipment, and address gaps in unit training plans.

NTC Train Up

The primary purpose of the THP is as a training management tool for corrective and sustainment training. However, an additional potential benefit is their usage for pre-rotational preparation. Most units specifically trained up for their NTC rotation. Many units stabilized their membership, beginning several months prior to their rotation, during both home station training and deployment. However, some units experienced heavy turnover just prior to deployment and borrowed soldiers or units from other battalions or brigades (or even used National Guard or Reserve personnel).

The written portion of the THP is infrequently used for NTC train up in comparison with AAR tapes. Many leaders reported being unable to use the written material for the train-up

process. Although a few commanders said they did use that portion, most of them were unable to specifically state how training guidance could be generated. In contrast, leaders from brigade through company levels relied on AAR tapes. These tapes were also frequently borrowed, from other units which had recently trained at the NTC, to supplement NTC training guidance.

Personnel turnover was frequently cited as the reason for not using the unit's previous written THP for NTC train up. Survey participants felt that these THPs were too dependent upon the "personalities" involved. Since unit composition had changed, the previous THP was thought to be no longer relevant. However, it is important to note personnel turnover was never cited as a problem in using the video tape portion for NTC train up. In fact, many of the AAR tapes used for training were borrowed from other units. A further indication that personnel turbulence was not the major factor limiting THP usage was found by examining units frequently rotating to the NTC. Such units would appear to be ideal candidates for using THPs for training guidance. However, leaders from some of these units (an aviation battalion, a forward support battalion, and an armor task force) emphatically stated THPs were not used.

Leaders share what they have learned about training, tactics, and SOP development with other units through a variety of mechanisms. Some prepare their own materials describing how

to be successful (i.e., accomplish missions) at the NTC. Others simply send copies of their AAR tapes to units requesting these materials. The criterion for deciding which tapes to use is recency; the most sought after tapes were from units recently rotating at the NTC. This preference was due to the user's perception that the "keys to winning at the NTC" changed over time. This was thought to be due to new equipment, fielded under force modernization, and changes in tactical doctrine. Many of those interviewed believed the NTC was a testbed for new doctrine. In addition, leaders believe NTC rules of engagement change over time. These are, in fact, continually evolving in an effort to further increase combat realism at the NTC.

Home-station Corrective/Sustainment Training

Few commanders reported being able to use the written portion for corrective or sustainment training after their rotation. As was the case for train up, most commanders were unable to specifically state how training guidance could be obtained from the written THP. Many instead reported using AAR tapes for such training.

Most units experienced a high rate of personnel turnover within the few months after their rotation. By the time the THP was disseminated down through the division, the unit may have lost many of its previous members. In addition, post-NTC

training was often directed towards other future training events (e.g., Reforger). Many of these other events were perceived as being only partially related to NTC training.

THPs are presently provided shortly after a rotation is completed. However, when these interviews were conducted, THPs for some units did not arrive until about three months after the unit returned from the NTC. Delayed receipt of THPs contributed to their underutilization and delays were particularly important for support units which often returned to the NTC within a few months. Certain division assets, such as aviation, field artillery, or forward support, might train at the NTC three or four times a year, accompanying different maneuver battalions. In addition, a company/team might train at the NTC with its parent battalion and then return to the NTC a few months later attached to a different battalion.

Users' Suggestions

Recommendations for enhancing THP training relevance emphasized reducing the size and complexity of the written portion and increasing the specificity of diagnosed training needs. These recommendations included deleting the detailed "blow by blow" accounts of each mission and replacing this with an analysis of mission outcome. This would include a brief explanation of mission outcome in terms of unit strengths and

weaknesses. A number of individuals clarified "brief" as two or three bullets on things done well and done poorly. Almost all commanders requested specific corrective training recommendations be provided for substandard performance on critical tasks. That is, requests were made to increase the specificity of THP contents, making it easier to identify and address training needs for specific units. Such feedback would describe the deficiency, clearly indicate the unit or element "at fault", and include specific recommendations for corrective training.

Conclusions

The greater success of AAR tapes over the written portion of the THP is due, in part, to the preference for video tapes over bulky documents as a method of communication. However, the success of tapes is also due to certain content features (relating specific training requirements to mission outcomes) which might be incorporated within the written THP.

In comparison with AAR tapes, the written portion of the THPs are difficult to use for determining specific corrective and sustainment training needed at home station. Users desire a brief statement of the mission outcome, a list of major unit strengths and weaknesses which directly contributed to that outcome, and a specific (who and what) listing of recommendations for corrective training. Specific corrective training

requirements would assist unit training in general. These changes would also reduce the writing workload of OCs.

SECTION IV. POTENTIAL THP REVISION

Training organized on unit METL supports developing feedback structured around performance on critical tasks. This feedback can be used to satisfy major user needs, emerging during the survey, for a detailed analysis of performance on critical mission tasks. The change in NTC training management (Figure 2) to emphasize unit METL may accordingly contribute to user requested THP revisions.

An overview of the analysis and feedback concept is diagrammed in Figure 3. For each mission, information would be obtained on task performance examined in terms of the planning, preparing, and executing phases of each echelon's METL. The actual number of critical tasks vary as a function of mission, phase, and echelon. Establishing the impact of each phase on mission outcome can be obtained through a detailed top-down analysis of performance data. This examination of factors underlying mission outcome can also identify the particular phase(s) and task force element(s) underlying key success(es) and failure(s). The identification of difficulties with particular components of unit METL may then be used to identify specific training recommendations for particular units. ARI, CATA, and the NTC are jointly developing the instrumentation system, measurement system, and the data base design required to support such an analysis and feedback concept.

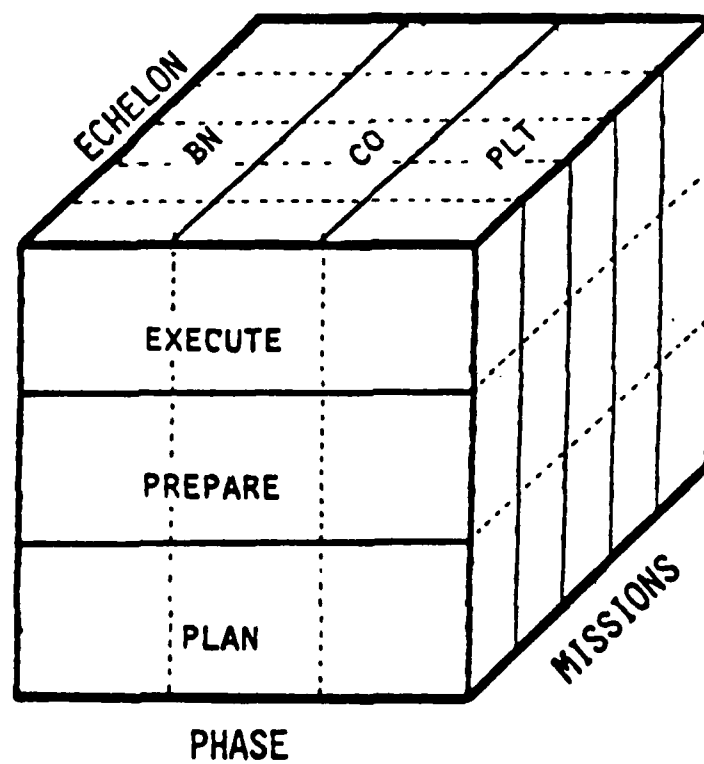


Figure 3. Proposed mission / task analysis

Performance Analysis System

ARI has developed procedures, through contract with BDM, for evaluating mission outcomes as well as identifying and measuring performance on mission-critical tasks. Figure 4-A provides an overview of the procedure developed for estimating mission effectiveness (Root & Zimmerman, 1988). This approach includes mission conditions and measurement standards against which mission performance is assessed.

Mission Effectiveness

Analysis begins with specification of the conditions or context within which unit performance is measured. This framework is defined by the range of METT-T (mission, enemy, troops, terrain, and time) conditions impacting a particular mission. Mission standards are then specified in order that an absolute measure of mission success may be determined (Figure 4-B). Figure 4-C illustrates structuring data requirements and effectiveness measures for METT-T attributes.

Task Analysis

The diagnostic analysis to identify underlying factors contributing to overall mission effectiveness begins with an examination of task performance during the execution phase. For

	MISSION		PERFORMANCE		ASSESSMENT
	CONDITIONS	PURPOSE	STANDARD	DATA REQUIREMENTS	
ATTITUDE					MEASURES OF EFFECTIVENESS
MISSION					
TERRAIN					
WEATHER					
ENEMY FORCES					
OWN FORCES					
TIME					
EFFECTIVENESS INDEX }					TOTAL

Figure 4-A. Unit performance measurement system

	CONDITIONS	MISSION STANDARDS		MISSION PERFORMANCE ASSESSMENT	
ATTRIBUTE	CONDITIONS	PURPOSE	STANDARD	DATA REQUIREMENTS	MEASURES OF EFFECTIVENESS
MISSION					
TERRAIN					
ENEMY FORCES					
FRIENDLY FORCES					
TIME					
EFFECTIVENESS INDEX }					TOTAL SCORE

MISSION STANDARDS		
ATTRIBUTE	PURPOSE	STANDARD
MISSION		
TERRAIN		
ENEMY FORCES	DESTROY THE ENEMY CAUSE THE ENEMY TO WITHDRAW	DESTROY % OR MORE OF THE ENEMY FORCE
FRIENDLY FORCES		
TIME		

Figure 4-B. Example of mission standards for defend

	CONDITIONS	MISSION STANDARDS		MISSION PERFORMANCE ASSESSMENT	
ATTRIBUTE	CONDITIONS	PURPOSE	STANDARD	DATA REQUIREMENTS	MEASURES OF EFFECTIVENESS
MISSION					
TERRAIN					
ENEMY FORCES					
FRIENDLY FORCES					
TIME					
				TOTAL	

MISSION PERFORMANCE ASSESSMENT		
ATTRIBUTE	DATA REQUIREMENTS	MEASURES OF EFFECTIVENESS
MISSION		
TERRAIN		
ENEMY FORCES	$\frac{\text{NUMBER OF ENEMY COMBAT SYSTEMS KILLED}}{\text{NUMBER OF ENEMY COMBAT SYSTEMS AT START}} \times 100$	ACTUAL MISSION RESULTS EXAMPLE: 75%
FRIENDLY FORCES		
TIME		

Figure 4-C. Example of mission performance assessment for defend

example, Figure 5 illustrates this approach to analyzing the execution of an attack mission. Based upon checklist input from OC observations, an unsuccessful attack mission might be determined to have failed because a mined obstacle was not breached. This, in turn, may have resulted from not securing an obstacle's near side. The omission might ultimately be due to identifiable individual soldier and leader failures. In most cases of execution failures, problems are expected to be due to failures at multiple levels, as described below.

After specific execution failures have been identified, the analysis would shift to an examination of performance during the underlying preparation phase. Continuing with the example in Figure 5, the failure to "fire M60 main guns" would be examined to determine why it occurred. For example, during the preparation phase, were specific elements given the responsibility for securing the near side of the breach? Did mission preparation include relevant issues such as providing adequate ammunition? After problems with preparation are identified, focus would again shift; the underlying planning phase then becomes the focus for analysis. In this example, the path analysis would examine whether the problem was attributable to a battalion or brigade omission in mission planning.

The type of performance analysis depicted in Figure 5 must be based upon an adequate measurement system and corresponding

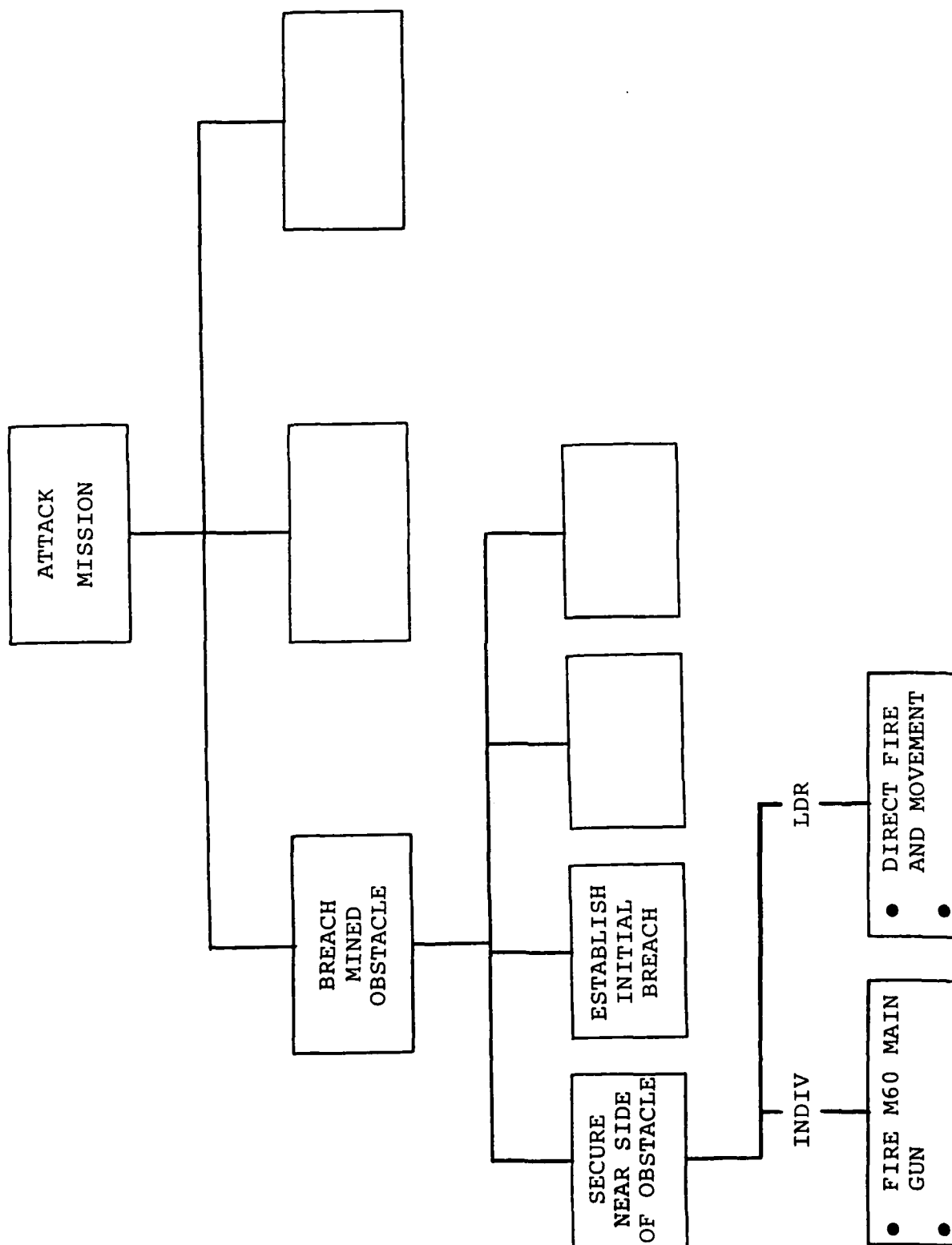


Figure 5. Top-down path analysis of performance execution

data base. An example of such a system recently developed is illustrated in Figure 6 (Lewman, 1987ab). Figure 6-A demonstrates the linkage for platoon tasks necessary for planning an OPORD. Individual tasks are identified in Figure 6-B.

Instrumentation System

The upgraded NTC instrumentation system is expected after the first quarter, FY89. Instrumentation will also be supplemented by the addition of several features particularly important for unit feedback. These are the electronic clipboard and Sun Workstations.

The clipboard is a hand-portable, software-controlled device for OC data collection in digital form (Perceptronics, 1986a-d). This will permit immediate input into a computerized data base and support the diagnostic analyses described above. Initial procurement of the clipboard for NTC and JRTC is now being processed by the Directorate for Army Ranges and Targets/Combat Training Centers (DART/CTC).

The new workstations will be located at both homestation and the NTC. Units will be provided with the digitized record of their instrumented performance, in addition to their THP, and can replay instrumented displays.

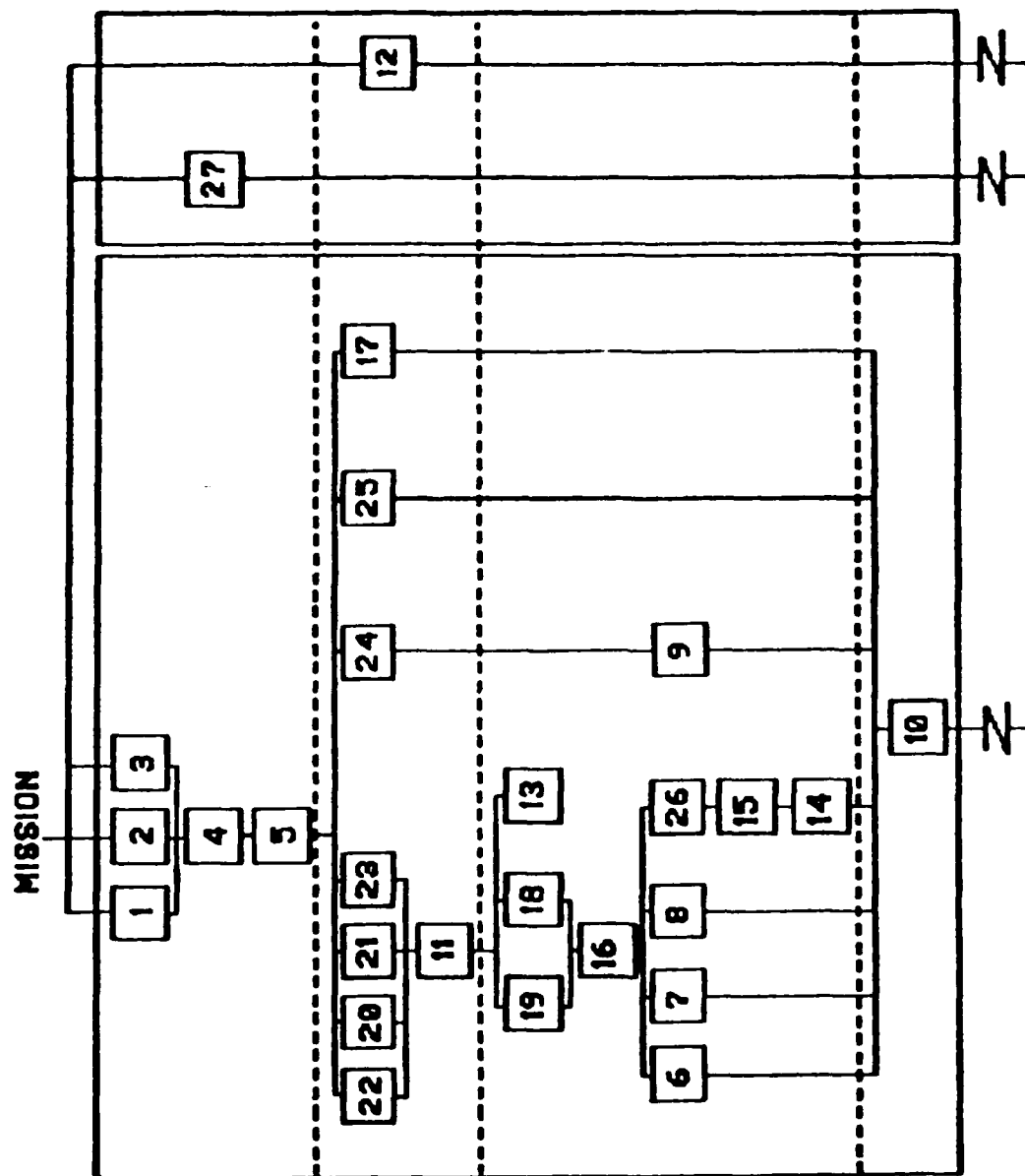


Figure 6-A. Sample task linkage in the planning phase of issuing a platoon OPORD for a deliberate day attack

<u>INTELLIGENCE</u>	
20	CONDUCT LEADER'S RECONNAISSANCE.
21	CONDUCT TERRAIN ANALYSIS.
22	IDENTIFY ENEMY'S STRENGTHS AND WEAKNESSES.
23	REPORT COMBAT INFORMATION.
<u>MANEUVER</u>	
11	ANALYZE COURSES OF ACTION.
13	PLAN FOR MUTUAL SUPPORT.
14	PLAN MOVEMENT FORMATIONS AND TECHNIQUES.
15	PLAN ACTIONS ON ENEMY CONTACT.
16	PLAN ACTIONS AT THE OBJECTIVE.
18	PLAN CONSOLIDATION.
19	PLAN REORGANIZATION.
12	MAINTAIN OPERATIONS SECURITY.
<u>FIRE SUPPORT</u>	
24	ANALYZE FIRE SUPPORT PLAN.
<u>AIR DEFENSE</u>	
25	PLAN AIR DEFENSE MEASURES.
<u>MOBILITY AND COUNTERMOBILITY</u>	
26	PLAN BREACHING OPERATION.
<u>COMBAT SERVICE SUPPORT</u>	
27	REPORT ON-HAND STATUS.
<u>NUCLEAR, BIOLOGICAL AND CHEMICAL</u>	
17	PLAN FOR NBC OPERATIONS.
<u>COMMAND AND CONTROL</u>	
1	CONDUCT MISSION ANALYSIS.
2	UNDERSTAND COMMANDER'S INTENT.
3	UNDERSTAND CONTROL MEASURES.
4	INITIATE PLANNING PROCESS.
5	ISSUE WARNING ORDER.
6	COORDINATE PLANNING WITH ADJACENT ELEMENTS.
7	GRAPHICALLY ILLUSTRATE SCHEMES OF MANEUVER.
8	PLAN REDUNDANT COMMUNICATIONS.
9	PLAN FIRE CONTROL MEASURES.
10	ISSUE OPORD.

Figure 6-B.

Figure 6-B. Platoon tasks within operating systems

Potential THP Contents

The unit performance measurement model presented here requires the establishment of well-defined Army performance standards and a data collection strategy incorporating detailed analysis of individual and collective tasks. THPs could then contain sections describing the following for each mission:

- mission assigned
- multi-echelon METL
- unit training objectives
- mission effectiveness
- diagnostic analysis of the underlying task performance associated with mission outcome
- specific training recommendations for each task force element (e.g., battalion staff, engineers, fire support, air defense).

A diagnostic analysis of task performance underlying each mission provides the basis for most of the above data summaries. Such analyses also permit performance to be summarized in terms of operating systems. These summaries result from aggregating the findings, across various mission analyses, to determine re-occurring difficulties with METL elements. These particular tasks are then compared with "templates" to relate each task to particular training elements responsible, training

recommendations associated with each task, and operating system(s) affected. This approach to revising the written THP would provide feedback consistent with that requested by commanders. An additional benefit would result from the improved input for the analytical community.

SECTION V. REFERENCES

- Department of the Army. (1988). Training the Force (Draft) FM 25-100). Washington, DC: Headquarters, Department of the Army.
- Lewman, T. J. (1987a). Mission Critical Tasks at the National Training Center (in review). Monterey, CA: The BDM Corporation.
- Lewman, T. J. (1987b). Mission Critical Effectiveness at the National Training Center (in preparation). Monterey, CA: The BDM Corporation.
- Perceptronics, Inc. (1986a). The Training Information Management System: User's Manual for the Training Base Station (ARI Research Note 86-76). Alexandria, VA: U.S. Army Research Institute. (AD A172 098)
- Perceptronics, Inc. (1986b). The Training Information Management System: User's Manual for the Electronic Clipboard System (ARI Research Note 86-77). Alexandria, VA: U.S. Army Research Institute. (AD A172 217)
- Perceptronics, Inc. (1986c). The Training Information Management System: Phase II Evaluation Report (ARI Research Note 86-78). Alexandria, VA: U.S. Army Research Institute. (AD A172 218)
- Perceptronics, Inc. (1986d). The Training Information Management System: Phase II Functional Specifications (ARI Research Note 86-79). Alexandria, VA: U.S. Army Research Institute (AD A172 097)
- Root, J. T. & Zimmerman, R. A. (In preparation) A Unit Effectiveness Measurement System at the National Training Center (ARI Research Report). Alexandria, VA: U.S. Army Research Institute. (AD A172 098)